Remarks

Applicant and the undersigned would like to thank the Examiner for the examination of this application. Claims 1-3, 6-11, 13-20, 25, 26, 30-34 ad 36 remain in the case. Claims 4, 5, 21-24, 27-29 and 35 are cancelled by this amendment. New claim 37 is added. No new matter is added by this amendment.

Examiner's Rejection of Claims

Claims 1, 4-6, 8-11, 16-19, 20, 25, 33 and 34 were rejected under 35 USC §102(b) as being anticipated by US Patent No. 3,761,870 to Drezin et al.

Claims 1, 4-6, 8-11, 16-19, 20, 25, 33 and 34 were rejected under 35 USC §103(a) as being unpatentable over US Patent No. 5,601,443 to Stinsky et al. in view of Drezin '870.

Claims 1, 7, 14, 15, 21-24, 26-29 ad 33-36 were rejected under 35 USC §103(a) as being unpatentable over US Patent No. 2,269,314 to MacDonald in view of Drezin '870.

Claims 1, 14, 21-24, 26-29 and 32-36 were rejected under 35 USC §102(b) as being anticipated by US Patent No. 1,956,037 to MacDonald.

Claims 2 and 3 were rejected under 35 USC §103(a) as being unpatentable over to Stinsky '443 in view of Drezin '870.

Claims 30 and 31 were rejected under 35 USC §103(a) as being unpatentable over to MacDonald '037 in view of Drezin '870.

The patentability of Claim 13 was not addressed.

Claims As Amended Distinguish Over Prior Art

The independent claims of the present application are amended to include the feature of at least one of the engagement surface comprising a convexly curved surface. Applicant submits that the "convexly curved surface" is substantively disclosed throughout the specification as filed and as illustrated in the drawings.

The present invention is directed to a high voltage/high power electrical connection device and comprises a pin and socket. The pin and the socket comprise each an engagement surface and the device further comprises a wedging portion that is flexible. The device is arranged so that the flexible wedging portion biases the engagement surfaces towards each other so that they frictionally engage and establish an electrical contact. At least one of the engagement surfaces is convexly curved. Because of the convexly curved surface, the biasing function of the wedging portion results in a lever force and consequently results in a very strong engagement. The extension of the contact area between the pin and the socket increases almost in proportion with the force that is applied by or through the wedging portion. It is therefore easier to establish electrical connections having a predictable property, which provides a significant advantage for use with high voltage/high power machinery, by way of example. One application of the electrical connection device according to the present invention may be in the mining industry where the electrical connection device is arranged for carrying currents of many hundred kilowatts and frequent connection and disconnection of the pin and the socket in the mobile machinery industry.

Because of the convexly curved surface, it is possible to structure the electrical connection device so that the connection is not only strong, but also inclusion of air between opposing engagement surfaces can be avoided. It is well known that the inclusion of the air is a detriment to the performance of the device for high voltage applications, as this would result in corona effect at the engagement surfaces.

The device disclosed in U.S. 2,269,314 by MacDonald is structurally different and does not have any of the above-identified advantages. The contact portions of the pin and the socket that are disclosed in MacDonald are straight portions. There is no disclosure of <u>convexly curved engagement surfaces.</u> When an electrical connection is established, the fingers 25,26 of socket are bent around the enlarged end 20 of the pin and initially the fingers 25,26 of the socket contact only the enlarged end 20 of the

conical pin. The end 20 of the pin biases the fingers 25,26 outwardly and portions 30 and 31 bias ends of the fingers 25,26 inwardly. This results in bow-like deformation of the fingers 25,26 so that a concave surfaces portion of the fingers 25,26 contacts the pin. Forceful electrical contacts are only possible at the enlarged end 20 of the pin and at ends of the fingers 25,26. In particular, and as a consequence of the bow-like or concave deformation of the fingers 25,26 around the enlarged end 20 of the pin, air is enclosed between the opposing contact surfaces, which is of significant detriment for high voltage and high power applications.

The device disclosed in U.S. 1,956,037 by MacDonald is also structurally different and does not have any of the above-identified advantages. The contact portions of the pin and the socket that are disclosed in this citation by MacDonald are straight portions. There is no disclosure of convexly curved engagement surfaces. When an electrical connection is established, the fingers 28 of socket are bent around the enlarged end of the pin 21 and initially the fingers 28 of the socket contact only the enlarged end 20 of the conical pin. The enlarged end of the pin 21 biases the fingers 28 outwardly and portions 20 and 22 bias ends of the fingers 28 inwardly. This results in a bow-like deformation of the fingers 28. Forceful electrical contacts are only possible at the enlarged end of the pin 21 and at ends of the fingers 28. Further, air is enclosed between the opposing contact surfaces, which is of significant detriment for high voltage and high power applications.

Yet further, Drezin '870 discloses a different structure and does not have the advantages of the present application. Drezin '870 discloses a device for connecting a co-axial cable to a connector. The co-axial cable comprises a lead 90 that is surrounded by an insulating portion, which in turn is surrounded by a metallic portion 84 and an outer sheath 82. The device comprises portion 64 and a right hand extension of portion 64 functions as a pin (see Figure 2). Consequently, Drezin et al discloses a static connector for connecting a co-axial cable and not a connection device that

comprises a pin and a socket that may be moved relative to each other. In addition, air is enclosed between contact surfaces, which is significantly detriment for high voltage and high power applications.

Further, Drezin '870 discloses a wedging portion that is formed from a dielectric flexible material. However, since Drezin '870 does not disclose a device having a socket and a pin, the disclosed wedging portion (a mushroom-like member having portions 58 and 60) does not bias an engagement surface towards another engagement surface to establish an electrical contact, which is an essential feature of the present invention. In addition, Drezin '870 does not disclose a device having an engagement surface that comprises a curved surface, which results in the above-identified advantages of the present invention. As a final observation we further submit that Drezin et al discloses a connector for a co-axial cable, which is unrelated to the field of the present invention as it does not relate to a connection device for a machine cable for high voltage mobile machinery.

Further, Stinsky '443 discloses an auto seizing connector. Consequently, Stinksy '443 teaches away from the present invention, as the flexibility of the wedge portion in accordance with the present invention avoids seizing. In addition, Stinksy '443 does not disclose, or teach towards, a device having an engagement surface that comprises a convexly curved surface.

In summary, Applicant submits the independent claims of the present application and the claims dependent thereon are novel in light of the cited prior art. Further, even if a skilled person would consider the cited prior art in combination, there is still no teaching of a connection device in accordance with the present invention. For example, the convexly curved surface of at least one of the engagement portions is clearly not taught in the prior art. Consequently, we submit that all claims of the present application are novel and inventive in light of the cited prior art.

Applicant respectfully submits that the above amendments place this application in a condition for allowance, and passage to issue is respectfully solicited. The Applicant and the undersigned would like to again thank the Examiner for the examination and guidance provided in the examination of this application. If the further prosecution of the application can be facilitated through telephone interview between the Examiner and the undersigned, the Examiner is requested to telephone the undersigned at the Examiner's convenience.

Respectfully submitted,

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